

***** MUSKRAT *****

*** NORMALIZING AND CONTACT RATE FACTORS ***

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
BODY WEIGHT													
Dean 1957	J	B	-	-	70		g	-10 days			c New York	marsh	Estimate based on study of 108 kits in 31 litters.
	J	B	-	-	130		g	-20 days			1954		
	J	B	-	-	180		g	-30 days					
Donohoe 1961	A	M	-	-	1,299		g			>700	Lake Erie	marshes	As cited in Perry 1982.
	A	F	-	-	1,257		g			>700			
Dozier et al. 1948	A	M	-	-	1,030		g				Maryland	NS	As cited in Perry 1982.
	A	F	-	-	962		g						
Dozier 1950	B	M	1	WI	1,644		g	680	2,380	2,152	New York	marsh	(1) 1944; (2) 1945; (3) 1946; (4) 1947; (5) 1948.
	B	F	1	WI	1,503		g	576	2,270	1,767	1943-48		
	B	M	2	WI	1,440		g	1,410	1,480	3,847			
	B	F	2	WI	1,361		g	1,330	1,400	3,589			
	B	M	3	WI	1,450		g	1,360	1,570	3,583			
	B	F	3	WI	1,300		g	1,210	1,420	3,895			
	B	M	4	WI	1,510		g	1,430	1,570	3,215			
	B	F	4	WI	1,390		g	1,350	1,440	3,450			
	B	M	5	WI	1,350		g	1,300	1,410	1,775			
	B	F	5	WI	1,240		g	1,190	1,330	2,004			
Dozier 1950	B	M	-	WI	1,480		g	1,400	1,520	14911	New York	marsh	Average of all years.
	B	F	-	WI	1,350		g	1,300	1,400	15001	1944-48		
Erickson 1963	A	M	1	-	1,153		g				c New York	NS	(1) First year adults; (2) second year adults. As cited in Perry 1982.
	A	F	1	-	1,181		g						
	A	M	2	-	1,370		g						
	A	F	2	-	1,323		g						
Errington 1939a	J	B	1	-	616		g	540	683	5	Iowa	marsh	(1) Kit stage - age 3-4 months.
	B	B	-	WI	1,092		g			34			
	A	B	-	SU	1,132		g			10			
	A	B	-	-	1,129		g			18			
	A	F	-	-	1,103		g			20			
Fuller 1951	A	M	-	-	1,131		g				Peace Delta,	NS	As cited in Boutin and Birkenholz 1987.
	A	F	-	-	1,053		g				CAN		
Low (unpublished) (osoyoosensis)	-	M	-	-	1,039		g				Utah	NS	As cited in Reeves and Williams 1956.
	-	F	-	-	957		g						

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
McDonnell & Gilbert 1981	A	F	-	SU	1,300	130	SD g			37	Ontario, CAN 1978	marsh	Captured in summer and fall. Juveniles: (1) from first litter of the year; (2) from second litter of the year.
	J	F	1	SU	510	170	SD g			65			
	J	F	2	SU	270	90	SD g			5			
	A	M	-	SU	1,200	170	SD g			37			
	J	M	1	SU	530	190	SD g			69			
	J	M	2	SU	290	60	SD g			12			
Neal 1968	J	M	-	-	510		g			112	Iowa 1967	marsh	Caught during summer and fall.
	J	F	-	-	510		g			91			
	A	M	-	-	1,190		g			21			
	A	F	-	-	1,219		g			18			
O'Neil 1949 (rivalicicus)	A	B	1	-	820		g			20	Louisiana 1940-45	marsh	(1) LaFouche Parish - 12 males, 8 females; (2) Vermilion Parish - 12 males, 8 females; (3) w Cameron Parish - 12 males, 8 females.
	A	B	2	-	910		g			20			
	A	B	3	-	1,040		g			20			
Parker & Maxwell 1984	J	B	-	FA			g	500	1,400		New Brunswick, CAN	woods, upland, marsh	Spring 1978 to fall 1980.
	J	M	-	FA	1,092		g						
	J	F	-	FA	1,073		g						
Parker & Maxwell 1984	A	M	-	FA	1,511		g				New Brunswick, CAN	woods, upland, marsh	Spring 1978 to fall 1980.
	A	F	-	FA	1,523		g						
	A	M	-	SP	1,483		g						
	A	F	-	SP	1,433		g						
Parker & Maxwell 1980	A	F	1	SP	1,234	152	SD g			100	New Brunswick, CAN	marsh	Year: (1) 1976; (2) 1977.
	A	F	2	SP	1,241	154	SD g			143			
	A	F	1	FA	1,450	179	SD g			7			
	A	F	2	FA	1,403	149	SD g			4			
	J	F	1	FA	1,057	85	SD g			17			
	J	F	2	FA	954	184	SD g			28			
Parker & Maxwell 1980	A	M	1	SP	1,367	136	SD g			134	New Brunswick, CAN	marsh	Year: (1) 1976; (2) 1977.
	A	M	2	SP	1,366	172	SD g			141			
	A	M	1	FA	1,497	167	SD g			4			
	A	M	2	FA	1,469	119	SD g			11			
	J	M	1	FA	1,083	20	SD g			22			
	J	M	2	FA	985	169	SD g			43			
Reeves & Williams 1956 (osoyoosensis)	A	M	1	SP	909		g			315	Idaho	marsh	(1) Gray's Lake, 1950; (2) Dingle Swamp, 1953.
	A	F	1	SP	837		g			267			
	A	M	2	SP	843		g			1020			
	A	F	2	SP	830		g			573			
Sather 1958	B	M	-	WI	1,180		g	730	1,550	198	Nebraska, nc Kansas	marsh	Weighed between December and March.
	B	F	-	WI	1,090		g			215			
Schacher & Pelton 1978	A	F	G	SP	1,443	74.9	SE g			8	e Tennessee 1972-73	Holston River	Pregnant females.
	A	F	G	SU	1,460	67.8	SE g			5			

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Schacher & Pelton 1978	A	F	N	SP	1,288	53.2	SE g			12	e Tennessee	Holston River	Nonpregnant females.
	A	F	N	SU	1,352	55.9	SE g			15	1972-73		
	A	F	N	FA	1,241	42.9	SE g			13			
	B	F	N	WI	1,221	54.2	SE g			13			
Schacher & Pelton 1978	A	M	-	SP	1,306	29.9	SE g			40	e Tennessee	Holston River	
	A	M	-	SU	1,337	28.1	SE g			19	1972-73		
	A	M	-	FA	1,308	51.5	SE g			11			
	B	M	-	WI	1,326	45.9	SE g			23			
Stevens 1953	A	M	-	-	1,114		g				MacKenzie	NS	As cited in Boutin and Birkenholz 1987.
	A	F	-	-	1,010		g				Delta		
Walker et al. 1975	A	B	-	-			g	700	1,800+		NS	NS	As cited in Willner et al. 1980.
Wilson 1956	A	M	-	-	1,102		g				Currituck Co.	NS	As cited in Perry 1982.
	A	F	-	-	1,053		g				NC		
NEONATE WEIGHT													
Dean 1957	N	B	-	-			g	20	25	44	c New York	marsh	N = number of litters; mean litter size was 3.8 +/- 1.8 S.D.
Errington 1939a	N	B	-	-	21.3		g	16	28	41	Iowa 1934, 1936-38	marsh	
Svihla & Svihla 1931 (rivalicia)	N	B	-	-	21		g				Louisiana 1925-27	marsh	"Very young muskrat".
GROWTH RATE													
Dean 1957	J	B	-	-	5.3		g/day				c New York	marsh	From birth to 30 days (approximate age at weaning).
Errington 1939a	J	B	-	-	5.4		g/day	4.3	5.6		Iowa 1934, 1936-38	marsh	From birth to 30 days. Mean is estimated from the "median" growth curve; min and max are estimated from the minimum and maximum growth curves.
Parker & Maxwell 1980	J	M	-	-	10.7		g/day				se New	marsh	Growth rate for first summer (from approximately 0 to 90 days).
	J	F	-	-	6.7		g/day				Brunswick CAN		
Parker & Maxwell 1984	J	M	-	-	7.5		g/day			54	New Brunswick,	woods, upland, marsh	Based on growth rate after weaning until first fall; duration of study = spring 1978 - fall 1980.
	J	F	-	-	7.1		g/day			38	CAN		

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes	
WEANING WEIGHT														
Errington 1939a	-	B	-	-			g	112	184		Iowa 1934, 1936-38	marsh	Estimated from median growth curve for days 21 (early weaning) and 30 (late weaning).	
Parker & Maxwell 1980	-	B	-	-	200		g			92	New Brunswick, CAN	woods, upland, marsh	Approximate weight of juveniles when they first leave the nest (at about 30 days of age).	
METABOLIC RATE (OXYGEN)														
Fish 1982	A	B	SW	-	38		l02/kg-d			87	Michigan	lab	Water temperature = 25 C; mean weight of muskrats = 649 g. Swimming (at surface) metabolic rate extrapolated from Figure 2, for swimming speed of 0.58 m/s (mean of swimming speeds measured). Resting rate measured with muskrat floating in water. Reference provides a regression equation for muskrat metabolic rate as a function of swimming speed.	
	A	B	R	-	21	7.9 SE	l02/kg-d							
Fish 1983	A	M	R	-	20.6	0.96 SE	l02/kg-d			48	Michigan	lab		Muskrats floating in water; water temperature 25 C, mean body mass = 614 grams.
Fish 1983	A	M	R	-	18.5	0.96 SE	l02/kg-d			48	Michigan	lab		Water temperature = 30 C; mean body mass = 614 grams. Resting = animals floating in water, swimming = animals swimming at surface at 0.58 m/s.
	A	M	SW	-	46.6		l02/kg-d							
MacArthur & Krause 1989	-	-	R	-	18.7		l02/kg-d				Manitoba, CAN	lab		Water temperature = 30 C. Resting = mean thermoneutral rate in air. Swimming = underwater swimming (voluntary dives).
	-	-	SW	-	53.3		l02/kg-d							
METABOLIC RATE (KCAL BASIS)														
Fish 1982	A	B	R	-	101		kcal/kg-d			87	Michigan	lab		Water temperature = 25 C, mean weight of muskrats = 649 g. Resting = floating in water; swimming = swimming at surface at a speed of 0.58 m/s.
	A	B	SW	-	182		kcal/kg-d							

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
FOOD INGESTION RATE													
Svihla 1931 (rivalicicus)	-	-	-	-	0.33		g/g-day				Louisiana	island	Muskrats eat about one third of their body weight per day. As cited in Perry 1982.
Svihla & Svihla 1931 (rivalicicus)	-	-	1	-	0.34		g/g-day			7	Louisiana 1925-27	captive	Based on wet weight of food: (1) fed paille-fin grasses (Panicum hemitomum, P. virgatum, and Spartina patens); (2) fed paille-fin grasses and corn.

THERMONEUTRAL ZONE

Perry 1982	-	-	-	-			degrees C	10	25	NS		lab	
------------	---	---	---	---	--	--	-----------	----	----	----	--	-----	--

*** DIET ***

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Martin et al. 1951	B	B	cattail bulrush burreed waterstarwort pondweed arrowhead corn				25-50 10-25 5-10 2-5 2-5 2-5 2-5	45	ne United States	NS - rough approximation of % diet; stomach contents	Species accounting for less than 2% of diet include willow, pear, buttercup, spikerush, horsetail, and pickerelweed. Author notes that there is also minor use of animal food.
O'Neil 1949 (rivalicicus)	B	B	three-cornered grass wiregrass hogcane misc. plants	80 10 5 5				NS	Louisiana 1940-45	brackish marsh - % of total usage; observation	Year round. Includes total usage: food, house construction, living areas.
O'Neil 1949 (rivalicicus)	B	B	three-cornered grass leafy three cornered grass & wiregrass hogcane misc.	70 10 10 10				NS	Louisiana 1940-45	prairie marshes - % of total usage; observation	Includes total usage: food, house construction, living areas.
O'Neil 1949 (rivalicicus)	B	B	canouche cattail wapato, roseau cane shoots Sagittaria spp. animal matter	70 10 10 5 5				NS	Louisiana 1940-45	freshwater marsh - % of total usage; observations	Year round. Includes total plant usage: food, house construction, living areas.

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Willner et al. 1975	-	-	cattail rush millet algae grass cord grass seeds other		59 17 8 5 4 4 2 3			NS	Somerset Co., MD	brackish marsh - % diet; stomach contents	Each plant fragment was identified and the number of fragments of each plant species/total number of fragments determined to yield % species in diet.
Willner et al. 1975	-	-	green algae 3-square rush switch grass soft rush water willow grass (Graminae) other		77 8 8 4 2 1 <1			NS	Montgomery Co., MD	freshwater - % of diet; stomach contents	Each plant fragment was identified and the number of fragments of each plant species/total number of fragments determined to yield % species in diet.
Willner et al. 1975	-	-	green algae switch grass sedge rush rice cut grass smartweed other		81 4 3 3 2 1 6			NS	Washington Co., MD	freshwater - % of diet; stomach contents	Each plant fragment was identified and the number of fragments of each plant species/total number of fragments determined to yield % species in diet.
Willner et al. 1975	-	-	green algae sedge switch grass manna-grass 3-square rush soft rush rice cut-grass corn other		36 16 11 8 7 7 4 3 8			NS	Garrett Co., MD	freshwater - % of diet; stomach contents	Each plant fragment was identified and the number of fragments of each plant species/total number of fragments determined to yield % species in diet.

*** POPULATION DYNAMICS ***

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
HOME RANGE SIZE													
Neal 1968	B	M	-	-	0.17		ha			10	Iowa 1966-67	marsh	Mark and recapture study; only animals captured more than 7 times listed here. Author found little further increase in home range size estimates after 5 recaptures.
	B	F	-	-	0.17		ha			7			

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Neal 1968	J	-	1	-	0.24		ha			6	Iowa 1966-67	marsh	Mark and recapture study; only animals captured more than 5 times listed here. Author found little further increase in home range size estimates after 5 recaptures. (1) Round Lake; (2) Rush Lake.
	A	-	1	-	0.17		ha			1			
	J	-	2	-	0.16		ha			20			
	A		2		0.12		ha			2			
Proulx & Gilbert 1983	-	-	1	SU	0.23	0.082 SD	ha				Ontario, CAN	marsh	Estimate of minimum home range size (i.e., area intensively used); (1) 1979, (2) 1980.
	-	-	2	SU	0.17	0.0078 SD	ha						
Proulx & Gilbert 1983	-	-	1	SU	0.39		ha			1	Ontario, CAN	pond	Estimate of minimum home range size (i.e., area intensively used); (1) Pond 1; (2) Pond 2.
	-	-	2	SU	0.32		ha			1			
Proulx & Gilbert 1983	-	-	1	SU	0.0484	0.0238 SD	ha				Ontario, CAN	east bay	Estimate of minimum home range size (i.e., area intensively used); (1) early summer, (2) late summer.
	-	-	2	SU	0.1112	0.0843 SD	ha				1979		
POPULATION DENSITY													
Beshears 1951	-	-	-	-	2.8		N/ha				Alabama	NS	As cited in Perry 1982.
Brooks & Dodge 1986	B	B	-	SU	23		N/km river			2673	Pennsylvania	riverine little vegetation	Sandy Lick study area; unglaciated river.
Brooks & Dodge 1986	B	B	-	SU	48		N/km river			5425	Massachusetts	wetland/river/sedges	Ware River study area; glaciated river.
Butler 1940	-	-	-	-	7.4		N/ha				Manitoba, CAN	sedges	As cited in Perry 1982.
Butler 1940	-	-	-	-	64.2		N/ha				Manitoba, CAN	common reeds	As cited in Perry 1982.
Clay & Clark 1985	A	B	1	SP	1.3		N/ha			7	ne Iowa	backwater riverine	Based on 5-night mark and recapture experiments in upper Mississippi sand sloughs. Dates for estimates: (1) late April 1981; (2) early September 1981; (3) late June 1982; (3) early October 1982.
	A	B	2	FA	2.4	0.6 SE	N/ha			4	1981-82		
	A	B	3	SU	0.6		N/ha			3			
	A	B	4	FA	1.7	0.1 SE	N/ha			8			
Clay & Clark 1985	A	B	1	SP	9.3	1.3 SE	N/ha			28	ne Iowa	open water riverine	Based on 5-night mark and recapture experiments in upper Mississippi capoli sloughs. Dates for estimates: (1) mid May 1981; (2) late September 1981; (3) mid June 1982; (3) early October 1982.
	A	B	2	FA	6.3	1.1 SE	N/ha			24	1981-82		
	A	B	3	SU	2.6	0.3 SE	N/ha			11			
	A	B	4	FA	4.4	0.5 SE	N/ha			14			
Errington 1948	-	-	-	-	49		N/ha				Iowa	cattail marsh	As cited in Perry 1982.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Errington 1948	-	-	-	-	25		N/ha				Iowa	Scirpus spp. marsh	As cited in Perry 1982.
Errington 1939b	A	B	-	SU	1.8		pairs/ha			30	Iowa 1935	marsh	Breeding pairs. Early summer. Low quality habitat; over the course of the summer as the water level decreased many animals left this area to go to areas with deeper water.
Gashwiler 1948	-	-	-	-	0.3-1.8		N/ha				Maine	marsh	As cited in Perry 1982.
Halbrook 1990	B	M	-	-	18.7		N/ha				Virginia	fringe marsh	Habitat is along the lower region of the Elizabeth River (75% Spartina sp.).
Halbrook 1990	B	M	-	-	2.1		N/ha				Virginia	marsh	Habitat is along the lower region of the Elizabeth River (75% Spartina sp.).
O'Neil 1949	-	-	-	-	28.3		N/ha	1	74		Louisiana 1942-45	Scirpus olneyi marsh	Min and max are extremes in yearly means from one of the six sites. Each site was studied for four years.
LITTER SIZE													
Arthur 1931	-	-	-	-	3.8					1058	Louisiana		As cited in Gashwiler 1950; based on embryo counts.
Beshears & Haugen 1953	-	-	-	-	4.0						Alabama	NS	Based on embryo counts; as cited in Parker & Maxwell 1984.
Chamberlain 1951	-	-	-	-	5.0						Massachusetts	marsh	As cited in Perry 1982.
Clay & Clark 1985	-	-	-	-	7.1	0.2 SE				219	ne Iowa 1981-82	riverine	Based on embryo counts.
Dean 1957	-	-	-	-	3.8	1.8 SD				31	c New York	marsh	Live litter counts.
Dibblee 1971	-	-	-	-	6.7						Prince Edward Island	NS	As cited in Parker & Maxwell 1984, based on embryo counts.
Dilworth 1966	-	-	-	-	5.8						s New Brunswick, CAN	NS	Based on embryo counts; as cited in Parker & Maxwell 1984.
Erickson 1963	-	-	-	-	6.3						c New York	ponds	As cited in Perry 1982.
Errington 1939a	-	-	-	-	8.2			5	11	6	Iowa 1934; 1936-38	marsh	Based on embryo counts.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Errington 1939a	-	-	-	-	6.5			1	11	158	Iowa 1934, 1936-38	marsh	Liver litter counts.
Gashwiler 1950	-	-	-	-	7.1					494	Maine 1945-48	statewide trapping	Based on embryo counts.
Gashwiler 1950	-	-	-	-	5.4			2	9	62	Maine	Moosehorn NWR	Based on count of live litters.
Halbrook 1990	-	-	-	-	4.65			3	6		Virginia	marsh (75% Spartina)	Habitat is near the Elizabeth River.
Hall 1981	-	-	-	-	6.5			1	11		North America	NS	Summarizing many studies.
Harris 1952	-	-	-	-	3.9						Maryland	NS	As cited in Boutin and Birkenholz 1987.
Mathiak 1966	-	-	-	-	7.3			1	12	460	Wisconsin 1947-57	marsh	Live litter counts.
Neal 1968	-	-	1	-	2.8			2	4		Iowa	marsh	(1) Mapping groups with similar birth dates (Round Lake); (2) Mapping groups with similar birth dates (Rush Lake); (3) Litters found by opening lodges (Round Lake); (4) Litters found by opening lodges (Rush Lake).
	-	-	2	-	4.2			2	7				
	-	-	3	-	4.0								
	-	-	4	-	7.5								
O' Neil 1949 (rivalicious)	-	-	-	-	3.46					103	Louisiana	NS	Embryo count.
O' Neil 1949 (rivalicious)	-	-	-	WI	3.7						Louisiana 1943	marsh	Live litter counts: (1) Mean for whole year.
	-	-	-	SP	3.5								
	-	-	-	SU	2.3								
	-	-	-	FA	3.5								
	-	-	1	-	3.22								
O'Neil & Linscombe 1976	-	-	-	-	3-4						Louisiana	NS	As cited in Perry 1982.
Parker & Maxwell 1980	-	-	-	-	6.8						New Brunswick, CAN	marsh	Year = 1976-77. Based on counts of placental scars using an estimate of 2.5 litters/year.
Parker & Maxwell 1984	A	-	-	-	8.4					36	New Brunswick, CAN	woods, upland, marsh	Based on counts of placental scars.
	Y	-	-	-	7.5					8			
Proulx & Gilbert 1983	-	-	-	-	6.3						Ontario, CAN	marsh	Embryo count.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Reeves & Williams 1956 (osoyoosensis)	-	-	1	-	7.0			2	9	35	Idaho 1949,	marsh	(1) Live litters (Gray's Lake); (2)
	-	-	2	FA	6.6			2	11	25	1953		placental scars in fall-trapped
	-	-	3	-	7.3			5	10	31			females (Gray's Lake); (3) Live
	-	-	4	-	7.1					66			litters (Dingle Swamp); (4) mean of
													66 live litters in both areas.
Sather 1958	A	-	1	-	6.3					60	Nebraska	marsh	(1) Live litter count; (2)
	J	-	2	WI	4.9					46	1949-52		placental scar count - precocial
													breeders.
Schacher & Pelton 1975	-	-	-	-	5.38					13	e Tennessee	riverine	Counted fetal implantations.
Seamans 1941	-	-	-	-	6.8			5	8	5	Vermont	NS	As cited in Gashwiler 1950, based
													on embryo counts.
Smith 1938	-	-	-	-	4.4				7	10	Maryland	NS	Based on embryo counts.
Smith et al. 1981	-	-	-	-	6.4					26	Connecticut 1976	marsh	Placental scar counts from
													fall-trapped muskrats.
Stewart & Bider 1974	-	-	-	SP	6.6	0.3 SE		5	8	16	Quebec, CAN 1973	drainage ditch	Placental scar and embryo counts.
Svihla & Svihla 1931 (rivalicia)	-	-	1	WI	3.7			1	6	263	Louisiana 1926	marsh	(1) Number of embryos in trapped
	-	-	2	WI	2.6								carcasses; (2) live litters
													observed in the wild. Data is from
													November - December.
Wilson 1954	-	-	-	-	3.7			1	6		N Carolina	marsh	As cited in Perry 1982.
LITTERS/YEAR													
Chamberlain 1951	-	-	-	-	2.7		/yr				Massachusetts	marsh	As cited in Perry 1982.
Clay & Clark 1985	-	-	1	-	2.0		/yr				ne Iowa	backwater sloughs	Habitat is part of the upper
	-	-	2	-	1.8		/yr				1981-82		Mississippi River. Year: (1) 1981;
													(2) 1982.
Clay & Clark 1985	-	-	1	-	1.5		/yr				ne Iowa	open water sloughs	Habitat is part of the upper
	-	-	2	-	1.9		/yr				1981-82		Mississippi River. Year: (1) 1981;
													(2) 1982.
Erickson 1963	-	-	-	-	1.5		/yr				c New York	ponds	As cited in Perry 1982.
Errington 1939a	-	-	-	-	2		/yr				Iowa	marsh	
Errington 1937a	-	-	-	-	2		/yr				nw Iowa	marsh	

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Gashwiler 1950	-	-	-	-	2.1		/yr				Maine 1945-48	NS	In wildlife refuge.
Halbrook 1990	-	-	-	-	1.84		/yr				Virginia	marsh	Habitat is along the Elizabeth River.
Neal 1968	-	-	1	-	1.2		/yr				Iowa	marsh	(1) Mapping groups of similar birth dates (Round Lake); (2) mapping groups of similar birth dates (Rush Lake); (3) placental scars (Round Lake); (4) placental scars (Rush Lake). Rush Lake is the superior habitat.
	-	-	2	-	3.4		/yr						
	-	-	3	-	2.0		/yr						
	-	-	4	-	3.0		/yr						
O'Neil 1949 (rivaliculus)	-	-	-	-	5-6		/yr		7-8		Louisiana	NS	Statewide data, general information.
Parker & Maxwell 1984	-	-	-	-	2.36		/yr			36	New Brunswick, CAN	woods, upland, marsh	Years from 1978-80.
Proulx & Gilbert 1983	-	-	-	-	2		/yr				Ontario, CAN	NS	
Reeves & Williams 1956 (osoyoosensis)	-	-	1	-	1.6		/yr			35	Idaho 1949-50, '52-53	marsh	(1) Placental scars/ avg. size (Gray's Lake); (2) uterus scars from fall trapped animals (Gray's Lake); (3) placental scars per breeding female/ avg. litter size (counted at less than one week of age)--(Dingle Swamp).
	-	-	2	-	1.7		/yr			25			
	-	-	3	-	2.4		/yr			-			
Schacher & Pelton 1975	-	-	-	-	2.3		/yr				e Tennessee	riverine	Calculated by dividing placental scars by mean litter size.
Smith 1938	-	-	-	-	3		/yr				Maryland	NS	
Smith & Jordan 1976	-	-	-	-	3.0		/yr				Connecticut	marsh	As cited in Parker and Maxwell 1984.
Smith et al. 1981	-	-	-	-	2.8		/yr	2	5		Connecticut 1976	marsh	
Stewart & Bider 1974	-	-	-	-	2		/yr				Ontario, CAN 1973	drainage ditch	
Wilson 1954	-	-	-	-	3		/yr				North Carolina	NS	As cited in Perry 1982.
DAYS GESTATION													
Asdell 1964	-	-	-	-	29-30		days				NS	NS	As cited in Wilson 1955.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Beer 1950	-	-	-	-	22-25		days				Wisconsin	NS	Considered by author to be "true gestation period"; longer periods are due to delayed implantation.
Erickson 1963; McLeod & Bondar 1952	-	-	-	-	25-30		days				NS	NS	As cited in Willner et al. 1980.
Errington 1937a	-	-	-	-	29-30		days	22-23			nw Iowa	marsh	Based on data from F.G. Ashbrook of U.S. Biological Survey.
Errington 1963	-	-	-	-	30		days				Iowa	marsh	
Gashwiler 1950	-	-	-	-	29-30		days				Maine 1945-48	NS	In wildlife refuge.
O'Neil 1949 (rivalicinus)	-	-	-	-	26-28		days				Louisiana	marsh	"Hearsay".
Reeves & Williams 1956 (osoyoosensis)	-	-	-	-	30		days				Idaho	marsh	
Wilson 1955	-	-	-	-	28-30		days				NS	NS	As cited in Perry 1982.
AGE AT WEANING													
Dozier 1953	-	B	-	-	28		days				United States	NS	
Errington 1939a	-	B	-	-	28		days	21	30		Iowa 1934; 1936-38	marsh	
Errington 1963	-	B	-	-	22-24		days		30		Iowa	marsh	
AGE AT SEXUAL MATURITY													
Svihla & Svihla 1931 (rivalicia)	-	B	-	-	6		months				Louisiana 1925-27	marsh	

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
ANNUAL MORTALITY													
Chamberlain 1951	J	-	1	-	61		%/yr				Massachusetts	NS	(1) 1949; (2) 1950. As cited in Perry 1982.
	J	-	2	-	73		%/yr						
Clay & Clark 1985	A	B	-	-	87		%/yr				ne Iowa	riverine	(1) Juvenile survival = survival from birth to the start of the next breeding season. Juvenile mortality from birth to October was 66% in 1981 and 45% in 1982. (Breeding season = March - September.)
	J	B	1	-	90		%/yr				1981-82		
Clay & Clark 1985	A	B	1	-	66		%/Mar-Sept				ne Iowa	open water riverine	Adult mortality over the breeding season; (1) 1981 data, (2) 1982 data.
	A	B	2	-	78		%/Mar-Sept				1981-82		
Clay & Clark 1985	B	B	-	WI	63		%/winter				ne Iowa	riverine	
											1981-82		
Clay & Clark 1985	A	B	-	WI	87		%/yr				ne Iowa	riverine	
											1981-82		
Dorney & Rusch 1953	J	-	-	-	18		% to fall				Wisconsin	NS	From birth to fall. As cited in Boutin and Birkenholz 1987.
Errington unpublished	A	B	-	SU	10		%/summer				NS	NS	In Olsen 1959 as cited in Proulx and Gilbert 1983.
Mathiak 1966	J	-	1	-	22		% to fall	10	36		Wisconsin	marsh	Mortality from: (1) birth to fall; (2) from birth to end of first year. Data from tag returns in a heavily trapped population. Author suggests that there is complete population turnover every 2 years. 1987.
	J	-	2	-	87		%/yr				1947-57		
Mathiak 1966	-	-	-	-			years		4	1	Wisconsin	marsh	One muskrat in heavily trapped population found to have survived 3 winters.
											1947-57		
Proulx & Gilbert 1983	J	-	1	FA	33.6		%/ fall				Ontario, CAN	marsh	(1) % mortality of juveniles during the fall trapping season; (2) same during first winter.
	J	-	2	WI	68.2		%/ winter						
Schwartz & Schwartz 1959	J	-	-	-	67		%/yr				Missouri	NS	As cited in Perry 1982.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
LONGEVITY													
Errington 1963	-	-	-	-			years		4		Iowa	marsh	
Godin 1977	-	-	-	-	3-4		years				New England	NS	As cited in Willner et al. 1980.
Proulx & Gilbert 1983	-	-	-	-			years		5		Ontario, CAN	marsh	

*** SEASONAL ACTIVITIES ***

Reference	Begin	Peak	End	Location	Habitat	Notes
MATING						
Beer 1950	earl Apr	Apr-June	Jun	s and c Wisconsin	NS	Most of the breeding takes place in this range, but some occurs as early as mid February and as late as mid August.
Chamberlain 1951	March		Sept	Massachusetts	marsh	As cited in Perry 1982.
Errington 1937a	Apr		May	nw Iowa 1934-36	marsh	
Gashwiler 1950	March	May-mid Jun	July	Maine 1945-48	NS	Habitat is in Moosehorn National Wildlife Refuge.
Lay 1945		year-round		Texas	marsh	As cited in Wilson 1955.
O'Neil 1949	yr round	Nov & Mar		Louisiana	marsh	Breeding occurs all times of year, with peaks in November and March and lows in July and August.
Parker & Maxwell 1984	March			New Brunswick CAN	woods, upland, marsh	
Reeves & Williams 1956 (osoyoosensis)	late Apr		mid July	Idaho 1949	marsh	
Schacher & Pelton 1975	March	Apr-July	mid Sept	Tennessee	river	
Smith 1938	most yr	Mar-Sept		Maryland	NS	Breeding occurs in most months, with peaks in March and September.

Reference	Begin	Peak	End	Location	Habitat	Notes
Svihla & Svihla 1931 (rivalicia)	yr round	Nov-Apr		Louisiana	marsh	Breeding occurs at all times of year.
Wilson 1955		year-round		North Carolina	NS	Breed year-round except during very cold winters.
PARTURITION						
Beer 1950	late Apr	late May	July	Wisconsin	NS	Most born during this range, but some born as early as March and as late as September.
Clay & Clark 1985	Feb/Mar	May	Aug/Sept	Iowa 1981-82	river sloughs	Habitat is on the upper Mississippi River.
Errington 1937a	late Apr	June	late Aug	nw Iowa 1934-36	marsh	
Gashwiler 1950	earl May		late Aug	Maine 1945-48	NS	Moosehorn National Wildlife Refuge.
Mathiak 1966	late Apr	mid May		Wisconsin	marsh	
Neal 1968	Apr 20	May 10-Jun 8		Iowa 1967	marsh	Round Lake.
Neal 1968	May 1		June 30	Iowa 1966	marsh	Round Lake.
Neal 1968	Mar 31	Mar31-Apr19		Iowa 1967	marsh	Rush Lake.
Reeves & Williams 1956 (osoyoosensis)	late May	earl July	mid Aug	Idaho 1949	marsh	N = 69.
Reeves & Williams 1956 (osoyoosensis)	earl May	May	late Aug	Idaho 1953	marsh	N = 70.
Stewart & Bider 1974 (zibethicus)	Apr	May		Quebec, CAN 1973	drainage ditch	A second peak occurred in June/July.
DISPERSAL						
Errington 1963		spring		Iowa	marsh	
McDonnell & Gilbert 1981		fall		Ontario, CAN	marsh	

***** EASTERN COTTONTAIL *****

*** NORMALIZING AND CONTACT RATE FACTORS ***

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
BODY WEIGHT													
Chapman & Morgan 1973	A	M	-	-	1,134	122	SD g	801	1,411	64	w MD, WV	farmland to woodland	
	A	F	-	-	1,244	165	SD g	842	1,533	36			
Lord 1963	A	B	1	FA	1,140	277	SD g				Illinois	sanctuary study area	Years: (1) 1956 (2) 1957 (3) 1958
	A	B	2	FA	1,168	249	SD g						(4) 1959 (5) Average of all four
	A	B	3	FA	1,132	262	SD g						years.
	A	B	4	FA	1,002	240	SD g						
	A	B	5	FA	1,111		g						
Lord 1963	A	B	1	WI	1,275	155	SD g				Illinois	sanctuary study area	Years: (1) 1957 (2) 1958 (3) 1959
	A	B	2	WI	1,307	113	SD g						(4) 1960 (5) Average of all four
	A	B	3	WI	1,276	106	SD g						years.
	A	B	4	WI	1,209	90	SD g						
	A	B	5	WI	1,267		g						
Lord 1963	A	B	-	-	1,231	164	SD g	700	1,800	691	Illinois	NS	L = Lactating
	A	F	L	-			g		1,786	1			
	J	B	-	-			g	100	1,300				
Lord & Casteel 1960 (mearnsi)	-	-	-	FA	1,140		g				c Illinois 1956-57	field/old field/ forest	(1) Late winter; Wildlife Sanctuary Area.
	-	-	1	WI	1,275		g						
Lord & Casteel 1960 (mearnsi)	-	-	-	FA	1,168		g				c Illinois 1957-58	field/old field/ forest	(1) Late winter; Wildlife Sanctuary Area.
	-	-	1	WI	1,307		g						
Lord & Casteel 1960 (mearnsi)	-	-	-	FA	1,132		g				c Illinois 1958-59	field/old field/ forest	(1) Late winter; rabbits were supplied with food. Wildlife Sanctuary Area.
	-	-	1	WI	1,276		g						
Lord & Casteel 1960 (mearnsi)	-	-	-	FA	1,002		g				c Illinois 1959-60	field/old field/ forest	(1) Late winter; Wildlife Sanctuary Area.
	-	-	1	WI	1,209		g						
Lord & Casteel 1960 (mearnsi)	-	-	-	FA	994		g				c Illinois 1959	field/forest	(1) Early winter; (2) late winter. Rabbits were supplied with food in the winter. 4-H study area.
	-	-	1	WI	1,226		g						
	-	-	2	WI	1,185		g						
Lord & Casteel 1960 (mearnsi)	-	-	-	FA	944		g				c Illinois 1958-59	field/forest	(1) Early winter; (2) late winter. 4-H study area.
	-	-	1	WI	1,169		g						
	-	-	2	WI	1,235		g						

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Lord & Casteel 1960 (mearnsi)	-	-	-	FA	931		g				c Illinois 1957-58	field/forest	(1) Early winter; (2) late winter. Rabbits were supplied with food in winter. 4-H study area.
	-	-	1	WI	1,249		g						
	-	-	2	WI	1,248		g						
Lord & Casteel 1960 (mearnsi)	-	-	-	FA	1,087		g				c Illinois 1956-57	field/forest	(1) Early winter; (2) late winter. 4-H study area.
	-	-	1	WI	1,256		g						
	-	-	2	WI	1,192		g						
Pelton & Jenkins 1970	A	B	NB	-	1,229	113 SD	g	1,093	1,461	24	Georgia 1965-68	mountain	
Pelton & Jenkins 1970	A	B	NB	-	1,313	141 SD	g	986	1,671	182	Georgia 1965-68	coastal	
Pelton & Jenkins 1970	A	B	NB	-	1,132	136 SD	g	793	1,579	189	Georgia 1965-68	Piedmont	
Pelton & Jenkins 1970	A	B	-	WI	1,176		g	793	1,671	96	Georgia	coastal, piedmont	
	A	B	-	SP	1,286		g	898	1,630	121	1965-68	mountain	
	A	B	-	SU	1,197		g	910	1,608	101			
	A	B	-	FA	1,255		g	886	1,669	77			
NEONATE WEIGHT													
Ecke 1955	N	-	-	-			g	35	45		c Illinois	NS	
Hill 1972b	N	-	-	-	42.2		g	36.0	49.0	6	Alabama 1963-66	NS	
Lord 1963	N	-	-	-	25.6		g			10	Illinois	captive	
PUP AND JUVENILE WEIGHT													
Lord 1963	P	B	-	-	57.8	10 days	g			10	Illinois	captive	Weights at different ages of juvenile cottontails.
	P	B	-	-	94.4	20 days	g			4			
	J	B	-	-	158.9	30 days	g			8			
	J	B	-	-	269.7	40 days	g			9			
	J	B	-	-	401.3	50 days	g			8			
	J	B	-	-	504.8	61 days	g			5			
	J	B	-	-	765.3	91 days	g			4			
	J	B	-	-	822.0	101 days	g			3			
	J	B	-	-	1,106.0	149 days	g			3			
GROWTH RATE													
Hill 1972b	-	-	1	-	5.6		g/day				Alabama	lab	Age in days: (1) 0-30; (2) 31-50;
	-	-	2	-	8.0		g/day						(3) 51-100; (4) 101-150.
	-	-	3	-	5.8		g/day						
	-	-	4	-	3.2		g/day						

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Lord 1963	J	B	1	-	3.22		g/day				Illinois	lab	Age in days: (1) 0-10; (2) 11-30; (3) 31-50; (4) 51-100; (5) 101-150.
	J	B	2	-	3.66		g/day						
	J	B	3	-	8.77		g/day						
	J	B	4	-	11.3		g/day						
	J	B	5	-	6.4		g/day						

METABOLIC RATE (OXYGEN)

Hinds 1973	-	-	-	SU	15.6		102/kg-d				NS	NS	As cited in Chapman et al. 1982.
(for similar species: <i>S. audubonii</i>)	-	-	-	WI	19.0		102/kg-d						

*** DIET ***

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Bailey & Siglin 1966 (mearnsii)	J	B	dandelion		9			NS	Illinois 1965	captive - food preference ranking	Preference ranking of 3 to 7 week old cottontails. Each plant tested against all others. Palatability = number of times a plant species was preferred during the 10 tests.
			prickly lettuce		9						
			giant ragweed		7						
			red clover		6						
			Rugel's plantain		6						
			smartweed		6						
			curly dock		5						
			wild carrot		3						
			crabgrass		3						
			common ragweed		1						
Dalke & Sime 1941 (mallarus & <i>S. transitionalis</i>)	-	B	(trees)						Connecticut 1935-37	NS - frequency of occurrence; observations of feeding on plant	Most of the observations (85%) were on the mallarus subspecies of the eastern cottontail. The New England cottontail exhibited similar food preferences, and so the data were combined. Summer observations made from April through October. Winter observations from January through March.
			gray birch		4		47				
			red maple		4		42				
			apple		4		12				
			aspen		1		12				
			choke cherry		3		12				
			wild black cherry		3		12				
			white pine		-		7				
			white oak		2		7				
			box elder		2		2				
			(shrubs and vines)								
			blackberry		13		52				
			dewberry		-		49				
			willow		3		35				
			black alder		1		34				
			maleberry		1		34				
			highbush blueberry		4		31				
			lowbush blueberry		1		19				
			silky dogwood		-		16				
			swamp rose		1		15				
			Spirea		2		14				
(continued)			arrowwood		3		1				

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Dalke & Sime 1941 (continued)			(herbs)								
			goldenrod		29		-				
			plantain		13		-				
			chickweed		11		-				
			sheep sorrel		10		-				
			wild strawberry		9		-				
			smartweed		6		-				
			other herbs		<6		-				
Dalke & Sime 1941 (mallarus & S. transitionalis)	-	B	trees	13	2	7	39		Connecticut 1937-38	several habitats	Months selected from the report to represent each season are April, July, October, and January.
			shrubs & vines	4	2	27	40			-	
			herbs	44	23	34	5			% frequency of occurrence;	
			grasses, sedges, rushes	26	56	30	6			observations of feeding on plants	
			crops	13	17	2	10				
Dusi 1952 (mearnsii)	B	B	winter vetch		6	-	-	15	Ohio 1947	NS (Williams Co.)	Data averaged from six sampling dates (with a total of 15 samples).
			corn		2	-	-			-	Field observations show no utilization of woody plants.
			timothy		-	2	4			mean % frequency of occurrence; scats	
			bluegrass		36	33	9				
			unidentified plants (no. days sampled)		58 (2)	65 (3)	87 (1)				
Dusi 1952 (mearnsii)	A	B	corn	1				11	Ohio 1947-48	NS (Wood Co.)	Average of 3 days sampling (11 samples collected). Unidentified
			orchard grass	8						-	thought to be mostly woody
			bluegrass	9						mean % frequency of occurrence; scats	material. At this time of year, preferred food is scarce.
			unidentified	82							
Dusi 1952 (mearnsii)	A	B	bluegrass	12	19		9	30	Ohio 1947-48	NS (Highland Co.)	Data from 30 pellets collected on 4 days. Field notes show no evidence of eating woody plants.
			orchard grass	31	3		20			-	
			timothy	4	25		15			mean % frequency of occurrence; scats	
			Korean lespedeza	2	3		12				
			wheat	8	-		-				
			red clover	-	10		-				
			alsike clover	-	-		3				
			unidentified	43	40		41				
Dusi 1952 (mearnsii)	A	B	bluegrass	34	34	25	32	101	Ohio 1947-48	NS (Highland Co.)	Seasonal means calculated from data on 101 freshly dropped pellet
			orchard grass	4	1	-	1			-	samples collected on 27 dates.
			timothy grass	5	12	7	1			mean % frequency of occurrence; scats	Woody tissues thought to make up the bulk of the unidentified
			nodding wild rye	5	11	8	4				materials on 3 of the winter sampling days.
			Canada goldenrod	-	-	3	-				
			red clover	-	-	6	-				
			unidentified	52	42	51	62				
			(no. sampling days)	(6)	(8)	(5)	(8)				

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Martin et al. 1951	B	B	smooth sumac				10-25	NS	Iowa	NS - rough approximation of % diet; observations	
			basswood				5-10				
			apple				5-10				
			red osier dogwood				2-5				
			hawthorn				0.5-2				
			oak				0.5-2				
			elderberry				0.5-2				
			willow				0.5-2				
			raspberry				0.5-2				
			elm				0.5-2				
Martin et al. 1951	B	B	sumac				25-50	NS	Michigan	NS - rough approximation of % diet; observations	Plants making up 0.5-2% of diet: sassafras, willow, hickory, grape, buckthorn, wild rose.
			plantain				5-10				
			dogwood				5-10				
			blackberry				5-10				
			yarrow				2-5				
			wild cherry				2-5				
			elderberry				2-5				
			oak				2-5				
			apple				2-5				
Martin et al. 1951	B	B	wheat		10-25			NS	Ohio	farm - rough approximation of % diet; observations	Season = all; season abbreviations following oats and carrots indicate the seasons when these food were present in diet.
			alfalfa		5-10						
			clover		5-10						
			soybean		5-10						
			oats (sp, su)		2-5						
			carrot (su, fa)		2-5						
			alsike clover		0.5-2						
			corn		0.5-2						
			rye		0.5-2						
			bluegrass		0.5-2						
Martin et al. 1951	B	B	redtop		0.5-2			76	Connecticut	NS - rough approximation of % diet; stomach contents and observations	Data is for eastern and New England cottontails in general for all seasons. Season abbreviations in parenthesis indicate particular seasons when food types were consumed; other foods were eaten in all seasons. Plants making up 0.5-2 % of the diet: wild millet, bristlegrass, chickweed, apple, wild strawberry, willow, dogwood, oak, winterberry, sumac, and paspalum.
			crabgrass		5-10						
			bluegrass		5-10						
			garden crops (su, fa)		5-10						
			clover		5-10						
			blackberry		5-10						
			plantain (sp, su, fa)		5-10						
			sheepsorrel (sp, su)		5-10						
			panicgrass		2-5						
			goldenrod (su, fa)		2-5						
			gray birch (su, fa)		2-5						
			red maple (wi, sp)		2-5						
			wild cherry (wi, sp)		2-5						
			blueberry		2-5						

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Spencer & Chapman 1986	A	B	woody plants	17	23	20	100	12	w Maryland	forest	
			forbs	19	30	46	-			-	
			grasses	64	47	34	-			% frequency of	
			(sample size)	(2)	(5)	(4)	(1)			occurrence; stomach contents	

*** POPULATION DYNAMICS ***

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
HOME RANGE SIZE													
Allen 1939	A	M	-	WI	1.5		ha	0.1	41.7		Michigan	NS	As cited in Trent and Rongstad 1974; based on tag and recapture experiments.
	A	F	-	WI	0.89		ha	0.1	3.1				
Althoff and Storm 1989	A	M	-	WI	3.2		ha				c Pennsylvania	mixed	
	A	M	-	SP	7.2		ha						
	A	M	-	SU	7.8		ha						
	A	M	-	FA	3.1		ha						
Althoff and Storm 1989	A	F	-	WI	2.1		ha				c Pennsylvania	mixed	
	A	F	-	SP	2.8		ha						
	A	F	-	SU	2.4		ha						
	A	F	-	FA	1.5		ha						
Dixon et al. 1981	A	M	-	WI	3.05	0.72 SE	ha			2 5 7	Wisconsin	woodlot	
	A	F	-	WI	2.99	0.28 SE	ha						
	A	B	-	WI	3.01	0.25 SE	ha						
Haugen 1942	A	M	BR	SU			ha	9.8	41.7		Michigan	NS	As cited in Trent and Rongstad 1974; based on tag and recapture data.
	A	F	BR	SU	9.12		ha	6.1	12				
Haugen 1942	A	M	NB	WI			ha	5.06	16		Michigan	NS	As cited in Trent and Rongstad 1974; based on tag and recapture data.
	A	F	NB	WI	5.7		ha	5.06	7.08				
Heard 1963	-	M	-	-			ha	1.6			sw MS 1959-63	forest, old field, bottom areas	
	-	F	-	-			ha	1.2					
Janes 1959 (floridanus)	-	-	-	-	2		ha				Kansas	NS	As cited in Trent and Rongstad 1974; based on tag and recapture data.
Jurewicz et al. 1981	A	F	1	SP	0.7		ha	0.4	1.3	5 5 7 7	Wisconsin	woodlot, farm	Home range: (1) diurnal; (2) nocturnal. Based on movements of radiotagged females.
	A	F	2	SP	2.5		ha	2.1	3.2				
	A	F	1	SU	1.2		ha	0.6	2.6				
	A	F	2	SU	3.7		ha	2.3	6.4				

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Lord 1963	B	B	-	-	0.95	0.75	SD ha			72	Illinois	NS	Based on tag and recapture data; some rabbits captured as few as three times.
	A	B	-	-	1.18	0.70	SD ha			13			
	J	B	-	-	0.92	0.75	SD ha			59			
	B	M	-	-	0.95	0.70	SD ha						
	B	F	-	-	0.95	0.78	SD ha						
Lord 1963	-	-	1	-	0.71	0.32	SD ha			16	Illinois	agricultural fields	(1) Sanctuary; (2) 4-H study area. Based on tag and recapture data; some rabbits captured as few as three times.
	-	-	2	-	1.0	0.81	SD ha			57			
Trent & Rongstad 1974	A	M	-	SP	2.7	0.77	SD ha			5	sw Wisconsin 1970-72	woodlots	(1) Early summer (2) late summer. Determined by radiotracking.
	A	M	1	SU	4.0	1.8	SD ha			4			
	A	M	2	SU	1.4	0.36	SD ha			5			
	A	F	-	SP	1.7	0.75	SD ha			5			
	A	F	1	SU	0.85	0.52	SD ha			6			
	A	F	2	SU	0.41	0.27	SD ha			6			
POPULATION DENSITY													
Bittner & Chapman (unpubl.)	-	-	-	-					10.2		St Clements Isl, MD	NS	As cited in Chapman et al. 1982.
Bittner & Chapman 1981	B	B	-	WI	10.2		N/ha				Maryland 1976-1977	island	
	B	B	-	FA	8.07		N/ha						
Crunden & Hendrickson 1955	-	-	-	-	2.93		N/ha				Iowa	NS	As cited in Bittner & Chapman 1981.
Eberhardt et al. 1963	B	B	1	FA	0.592		N/ha			728	sc Michigan 1951-57	woods/marsh/fields	Entries (1) through (7) correspond to the years 1951 through 1957, respectively. Hunting seasons were Oct 15-Dec 31 in 1951, Oct 20-Jan 31 in 1952-56, and Oct 21-Mar 1 in 1957.
	B	B	2	FA	0.641		N/ha			788			
	B	B	3	FA	0.777		N/ha			956			
	B	B	4	FA	0.773		N/ha			951			
	B	B	5	FA	0.747		N/ha			919			
	B	B	6	FA	0.644		N/ha			792			
	B	B	7	WI	0.996		N/ha			1225			
Eberhardt et al. 1963	-	-	-	FA	1.07	0.41	SD N/ha	0.41	2.08	11	c Michigan 1947-57	woods/marsh/fields	Sample size is in years.
Edwards (unpubl.)	-	-	-	FA	3.1		N/ha			2400	Delaware, OH	NS	Sample size = 2400 hectares. As cited in Chapman et al. 1982
Edwards et al. 1981	B	B	-	FA			N/ha	1.8	7.4		c Illinois 1956-1978	forested 4-H area	
Heard 1963	-	-	-	WI	1.1		N/ha			46	sw MS 1959-63	forest, old field, bottom areas	

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Jurewicz et al. 1981	B	B	1	FA	8.1		N/ha				Wisconsin	woodlot & farms	Year: (1) 1973; (2) 1974; (3) 1975.
	B	B	2	FA	6.6		N/ha						
	B	B	3	SP	1.6		N/ha						
Leite 1965	-	-	-	FA	14.9		N/ha			210	Urbana, OH	NS	Sample size = 210 hectares. As cited in Chapman et al. 1982.
Lord & Casteel 1960 (mearnsi)	B	B	-	FA			N/ha	3.0	5.9		Illinois	old field	
	B	B	-	WI			N/ha	0.67	1.5		1956-1960		
Lord & Casteel 1960 (mearnsi)	B	B	-	FA			N/ha	5.9	8.2		Illinois	planted trees, field	
	B	B	-	WI			N/ha	0.77	3.2		1956-1970		
Pils & Martin 1978	-	-	-	FA	7.4		N/ha				s Wisconsin	various	Data based on 331 individual cottontails plus 724 recaptures.
	-	-	-	WI	7.0		N/ha				1971-75		
Sandt & McKee 1978	-	-	-	-	0.73		N/ha				e Maryland	wildlife manag. area	As cited in Bittner & Chapman 1981.
Trent & Rongstad 1974	-	-	-	SU	4.2		N/ha				sw Wisconsin	experimental farm	
	-	-	-	FA	10.1		N/ha				1970-72		
	-	-	-	SP	3.7		N/ha						
	-	-	-	SU	5.7		N/ha						
	-	-	-	FA	8.9		N/ha						
LITTER SIZE													
Allen 1939	-	-	-	-	5.1					11	Michigan	NS	As cited in Chapman et al. 1982.
Barkalow 1962	-	-	-	-	3.2						Alabama	NS	As cited in Bothma and Teer 1977.
Beule 1940	-	-	-	-	5.42					26	Pennsylvania	NS	As cited in Chapman et al. 1982.
Bittner & Chapman 1981	-	-	-	-	3.57	1.32 SD				21	Maryland 1976-1977	island	Measured as viable fetuses.
Bothma & Teer 1977	J	-	-	-	3.10					80	Texas 1965-68	grassland	(1) Older adults; (2) all ages. All seasons.
	A	-	-	-	3.38					138			
	A	-	1	-	3.56					52			
	-	-	2	-	3.33					270			
Chapman et al. 1977	-	-	-	-	4.8-5.3						w Maryland 1971-72	NS	
Conaway et al. 1963	-	-	2	-	6.2	0.28 SD				15	Missouri	J Reed Wildlife Area	(2) 2nd litter; (3) 3rd litter; (4) 4th litter; (A) average of 2-4. Embryo count.
	-	-	3	-	6.24	0.21 SD				14			
	-	-	4	-	5.5	0.39 SD				14			
	-	-	A	-	6.0					43			

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Conaway et al. 1974	-	-	1	SP	3.4					50	midwest, 30-35	NS	Size of (1) first litter and (2)
	-	-	2	SP	4.0					71	N lat, 1964		second litter.
Conaway et al. 1974	-	-	1	SP	4.2					158	midwest, 35-40	NS	Size of (1) first litter and (2)
	-	-	2	SP	5.5					86	N lat, 1964		second litter.
Conaway et al. 1974	-	-	1	SP	5.0					21	North Dakota	NS	Size of (1) first litter and (2)
	-	-	2	SP	3.0					2	1964		second litter.
Conaway et al. 1974	-	-	1	SP	5.1					36	midwest, 40-45	NS	Size of (1) first litter and (2)
	-	-	2	SP	7.0					4	N lat, 1964		second litter.
Conaway et al. 1974	-	-	1	WI	2.6					27	FL, TX, 25-30	NS	
	-	-	2	WI	3.4					55	N lat 1965		
Ecke 1955	-	-	1	-	4.7					5	c Illinois	NS	(1) Placental scar counts; (2)
	-	-	2	-	6.5					13	1947-48		embryo counts; (3) average number
	-	-	3	-	4.9					13			of young in nests; (4) mean of
	-	-	4	-	5.6			3	9	31			estimates 1, 2 & 3. Note: wide
													variation due to seasonal
													differences in collecting.
Hamilton 1940	-	-	-	-	4.5			2	7	22	wc New York 1932-38	NS	
Haugen 1942	-	-	-	-	5.4						Michigan	NS	As cited in Bothma and Teer 1977.
Heard 1963	-	-	-	-	3.50	1.02 SE		5	2	55	Mississippi 1959-63	forest, old field, bottom areas	
Hill 1972a	-	-	-	-	3.47					611	Alabama	NS	As cited in Chapman et al. 1982.
Hill 1972c	-	-	1	-	3.5	0.0416 SE				611	Alabama	see footnotes	Habitat: (1) all habitats combined;
	-	-	2	-	3.2					178	1953-67		(2) lower coastal plains; (3)
	-	-	3	-	3.3					57			piedmont plateau; (4) upper coastal
	-	-	4	-	3.3					128			plains; (5) Tennessee valley; (6)
	-	-	5	-	3.6					175			black belt. Embryo count.
	-	-	6	-	4.1					73			
Lord 1961	-	-	-	-	5.3						Illinois	NS	As cited in Bothma and Teer 1977.
Lord 1963	-	-	1	-	5.95					109	Illinois	NS	(1) 1957; (2) 1958; (3) 1959; (4)
	-	-	2	-	5.06					165	1957-59		total. Embryo count.
	-	-	3	-	5.31					195			
	-	-	4	-	5.31					469			
Lord 1963	-	-	1	-	4.77					34	Illinois	NS	(1) s and e Illinois; (2) c
	-	-	2	-	6.17					29	1957-59		Illinois. Embryo count.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Pelton & Jenkins 1971	-	-	-	-	3.1						Georgia	NS	As cited in Chapman et al. 1980.
Trethewey & Verts 1971	-	-	-	-	5.10					106	w Oregon	NS	As cited in Chapman et al. 1982.
Wainright 1969	-	-	-	-				3.57			throughout range	NS	Value reflects most cottontails throughout range. As cited in Bittner and Chapman 1981.
LITTERS/YEAR													
Bittner & Chapman 1981	-	-	-	-	4.81		/year				Maryland 1976-1977	island	
Chapman et al. 1977	-	-	-	-	4.6		/year				w Maryland 1971-72	NS	
Chapman et al. 1980	-	-	-	-			/year	5	7		several	several	Summary of several studies (i.e., Sheffer 1957; Conaway et al. 1963; Evans et al. 1965; Trethewey & Verts 1971).
DAYS GESTATION													
Bothma & Teer 1977	-	-	-	-	28		days				s Texas 1965-68	grassland	
Chapman et al. 1982	-	-	-	-	28		days	25	35		NS	NS	Summary of several other studies.
Conaway et al. 1963	-	-	-	-	27		days				Missouri 1961	J. Reed Wildlife Area	Summarizing Hendrickson 1943; Marsden and Conaway 1963.
Ecke 1955	-	-	-	-	30		days	25	32		US	NS	Summarizing data from: Seton 1929; Prouty 1937; Gerstell 1937; Dalke 1942; Haugen 1942.
Peterson 1966	-	-	-	-			days	26	28		NS	NS	As cited in de Poorter and van der Loo 1981.
AGE AT WEANING													
Allen 1938	-	-	-	-	16		days				NS	NS	As cited in Ecke 1955; determined by length of time spent in nest.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Dalke 1942	-	B	-	-			days	14	16		NS	captive	As cited in Ecke 1955; determined by length of time spent in nest.
Ecke 1955	-	-	-	-	20-25		days				Illinois	NS	Author notes that it appears that many young are nursed for at least 4-5 days after leaving the nest.
Peterson 1966	-	-	-	-			days	28	35		NS	NS	As cited in de Poorter and van der Loo 1981.
AGE AT SEXUAL MATURITY													
Bothma & Teer 1977	-	F	-	-			months	5			s Texas	grassland	
Conaway & Wight 1963	-	M	-	-			months	3	6		Missouri	NS	
Lord 1961; Negus 1959b	-	F	-	-			months	3	6		NS	NS	Cited in Conaway & Wight 1963.
ANNUAL MORTALITY													
Eberhardt et al. 1963	A	F	-	-	71.7		%/yr				sc Michigan	woods/marsh/fields	Average of all 18 years of study.
	J	F	-	-	85.5		%/yr				1938-55		
Eberhardt et al. 1963	A	F	1	-	77.1		%/yr				sc Michigan	woods/marsh/fields	(1) 1938-45; (2) 1946-50; (3) 1951-55.
	A	F	2	-	66.0		%/yr				1938-55		
	A	F	3	-	71.9		%/yr						
	J	F	1	-	84.0		%/yr						
	J	F	2	-	85.2		%/yr						
	J	F	3	-	87.2		%/yr						
Heard 1963	-	-	-	WI	79		%/yr			46	sw MS 1959-63	forest, old field, bottom area	Winter mortality, methods questionable.
Lord 1963	-	-	1	-	86		%/yr			333	Illinois 1957-60	4-H study area	(1) Winter with food supplied for rabbits; (2) no food supplied; (3) average over 4 years. Area was hunted.
	-	-	1	-	88		%/yr			259			
	-	-	2	-	59		%/yr			324			
	-	-	2	-	83		%/yr			239			
	-	-	3	-	79	14 SD	%/yr						
Lord 1963	-	-	1	-	74		%/year			238	Illinois 1957-60	sanctuary study area	(1), (2), (3) area hunted; (4) closed to hunting; (5) average of 4 years.
	-	-	2	-	65		%/year			120			
	-	-	3	-	62		%/year			171			
	-	-	4	-	57		%/year			125			
	-	-	5	-	65	7 SD	%/year			654			

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Trent & Rongstad 1974	-	-	1	-	85		%/yr				sw Wisconsin 1970-72	experimental farm	Estimate based on: (1) trapping; (2) radiotracking.
	-	-	2	-	80		%/yr						
LONGEVITY													
Bruna 1952	-	-	-	-	1.25		years				Kentucky	NS	As cited in Chapman et al. 1980.
Eisenberg 1981	-	-	-	-			years		9.6		NS	captive/zoo	
Lord 1963	-	-	-	-			years		10		Illinois	lab	Author's guess as to potential life span of the cottontail.

*** SEASONAL ACTIVITIES ***

Reference	Begin	Peak	End	Location	Habitat	Notes
MATING						
Barkalow 1962	Jan		Sep	Alabama	NS	As cited in Chapman et al. 1980 and Bothma and Teer 1977.
Bittner & Chapman 1981	mid Feb	Apr-May	mid Jul	Maryland 1976-1977	island	Total duration of about 130 days.
Bothma & Teer 1977	yr round	Jan-Apr		s Texas	grassland	Mated all year long, Jan-Apr is the peak.
Chapman et al. 1977	late Feb		Aug	w Maryland	NS	
Conaway et al. 1974		earl-mid Feb		midwest, 30-35 N lat, 1964-65	NS	Mean date of first conception.
Conaway et al. 1974		Feb-Mar		midwest, 35-40 N lat, 1964-65	NS	Mean date of first conception from early February to late March across two years.
Conaway et al. 1974		Mar		midwest, 40-45 N lat, 1964-65	NS	Mean date of first conception.
Conaway et al. 1974		Mar-Apr		North Dakota 1964-65	NS	Mean date of first conception, late March in 1964 and early April in 1965.
Conaway et al. 1974		earl Feb		Florida 1965	NS	Mean date of first conception.

Reference	Begin	Peak	End	Location	Habitat	Notes
Conaway et al. 1974		late Jan		Texas 1965	NS	Mean date of first conception.
Dalke 1942	mid Mar		mid Sep	Connecticut	NS	As cited in Chapman et al. 1982.
Eberhardt et al. 1963	mid Mar			sc Michigan 1951-57	woods/marsh/field	Breeding date changes depending on ratio of juvenile to adult.
Ecke 1955	late Feb	early Mar	Sept	Illinois	NS	
Hamilton 1940	late Feb			wc New York 1932-38	NS	
Haugen 1942	Mar		Aug	Michigan	NS	As cited in Bothma and Teer 1977.
Heard 1963	Feb.			sw MS 1959-63	forest, old field, bottom areas	
Hill 1972a	Dec			Alabama	NS	As cited in Bittner and Chapman 1981.
Lord 1961	Mar		Sept	Illinois	NS	As cited in Bothma and Teer 1977.
Pelton & Provost 1972		9 months		Georgia	NS	As cited in Chapman et al. 1982.
Pelton & Jenkins 1971			Oct	Georgia	NS	As cited in Bittner and Chapman 1981.
Rongstad 1966	late Mar			s Wisconsin	NS	As cited in Chapman et al. 1980.
Schierbaum 1967	Feb		Sep	New York	NS	As cited in Chapman et al. 1982.
PARTURITION						
Hamilton 1940	Apr	May-July	Aug	wc New York 1938	NS	
FALL MOLT						
Bothma & Teer 1982	Aug	Oct	Dec	s Texas 1967-68	brush/grass	
Negus 1959a		Sept-Oct		Connecticut	NS	As cited in Bothma and Teer 1982.
Spinner 1940	Sept	Sept-Oct	Nov	Connecticut 1936-38	NS	

Reference	Begin	Peak	End	Location	Habitat	Notes
Spinner 1940	Sept	Sept-Oct	Nov	Connecticut 1936-38	NS	
SPRING MOLT						
Bothma & Teer 1982	Feb	April	July	s Texas 1967-68	brush/grass	
Spinner 1940	late Mar	May-June	Aug	Connecticut	NS	

